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D.D.T. and Gammexane in Canine Practice

By

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As a result of the wide publicity given to D.D.T. as an insecticide, the general public (and, indeed, the practitioner) has been given an impression that any ecto-parasite or fly will succumb to its effects, and that the substance is non-toxic for man and animals.

Both of these assumptions are incorrect, and it seems necessary to lose no time in warning small-animal practitioners that D.D.T. is toxic except under certain circumstances. It is to be regretted that the general release of D.D.T. has been extended to the laity, as we find that almost every little "general" shop or pet shop is selling the substance indiscriminately, the purchasing public believing that it is harmless. The drug is extremely cumulative,[1] and cats are especially susceptible to its cumulative action.[2]

Apart from any idiosyncrasy, it is well known how domestic cats naturally will lick off anything applied to the coat. Believing in the early reports of the non-toxicity of D.D.T. dust to small animals, the writer applied some to a cat for exterminating fleas. Several days later the cat was brought in suffering from unaccountable symptoms (which included nausea, hyper excitability, tremors, extensor tetany, inability to stand and, apparently, great pain. No suspicion attached to D.D.T. and the diagnosis could not be determined. Death ensued.

Soon afterwards another cat was brought in also suffering from unaccountable symptoms from which it, too, died. Only later was it elicited that the owner had been applying D.D.T. dust. About the same time a colleague requested a second opinion concerning a dog manifesting paraplegia, muscular tremors, hyperaesthesia, etc.; but on this occasion we were informed that the animal had had several D.D.T. baths against ecto-parasites. Appropriate measures were taken and the dog recovered. A second dog was treated for a similar complaint and also recovered.

The drug appears severely to damage the liver and to exert a specific action upon the nervous system with the production of local and generalized muscular tremors, paralysis and sometimes convulsions.

According to Cameron[3] "With large single doses of D.D.T. administered by any route signs of intoxication appear in 12 to 24 hours. The animal feels cold, its fur is ruffled and diarrhoea may be present. It appears to be nervous and very sensitive to stimuli. Muscular weakness sets in, especially in the muscles of the back; fine and coarse tremors develop in the back and limbs, and the animal may shake violently for hours on end. Movement is restricted, staggering and spastic. . . . A mild secondary anaemia, toxic in type, and pronounced leucocytosis are quite common in animals. Leucocytosis seems to be correlated with clinical features of intoxication and serves as an intimation that the toxic level is being reached."

Anorexia and loss of weight are early in evidence, followed soon by hyperexcitability[4] and extensor rigidity. Death from respiratory failure occurs perhaps within 48 hours, or may be delayed for several days.

Upon autopsy the chief lesions found are fatty degeneration and necrosis of the liver.[5] There may be pulmonary oedema and/or fatty degeneration of the kidneys or myocardium. D.D.T. has been found in all tissues examined and in the faeces. The highest concentrations are present in the bile and fatty tissue.[6] The urinary excretion of D.D.T. is very slow. It can be demonstrated in the tissues 15 days following a single administration of the drug.[1]

Lactating dogs receiving D.D.T. by mouth have secreted milk containing appreciable levels of the drug.[6]

D.D.T. is not rapidly lethal: affected animals which have come under the writer's observation have exhibited visible symptoms for several days up to more than a week before succumbing. Even the insect seems to survive its action for 24 hours or more before eventually dying.[7] The effect on the fly is apparently also on the nervous system. To insects, D.D.T. is both a stomach and a contact poison, but no spectacular or "knock-down" effect is to be anticipated unless this agent is incorporated in emulsions or solutions with pyrethrins or other agents which exert a rapid action.[3]

One might ask: "Why add D.D.T. if the pyrethrins, etc., have a knock-down effect?" The answer appears to be that such rapid effects are fleeting, whilst those of D.D.T. may endure for weeks or even months on walls or objects which are treated.

Striking success has been achieved against such diverse pests as house flies, stable flies, cockroaches, lice, bugs, mosquitoes, fleas, moths and locusts.[8] Läuger calculated that on glass a deposit of one billionth of a gramme per sq. cm. (or 1 oz. per 1,000 square miles) is fatal to house flies.[9] He stated that insects once affected by D.D.T., no matter how slightly, inevitably die. "One after another so many insects were found susceptible to the action of D.D.T. that this substance was soon on the way to being regarded as a certain cure for every ill attributable to an insect pest. But greater experience and a more restrained and critical approach have somewhat modified the picture."[8]

Nevertheless, we now have an excellent means of ridding our kennels and cookhouses of the pestilential, disease-conveying house fly and blowfly. The choice of vehicle in which D.D.T. is to be incorporated is important in this connection, as will be later seen. D.D.T. is very slightly soluble in water, so that it has to be used as a dust, in oily solution *or as a mist*. In the former case it is mixed with clays, talcs, sulphur, etc., and ground into fine powders containing minute particles of D.D.T. in various strengths.

If a wetting agent be added to such powders they can be mixed with water and used as sprays. Oily solutions employ various petroleum oils, especially kerosine, xylene, and other solvents for dissolving D.D.T. In this way spray-solutions or emulsions are prepared.

Aerosols and mists make use of sesame oils, cyclo-hexanone, freon and other oily solvents as dispersing media. Absorption into the body is thus dependent on the physical state of D.D.T. during contact with the surface and body cavity tissues. In general it may be said that powdered forms present little risk of absorption, but oily solutions and emulsions can penetrate some of them with ease.[3] Thus, whilst little risk would attach to the treatment of a dog's or cat's coat with D.D.T. dust, or aqueous suspension, from the absorption point of view, precautions would have to be taken against licking.

The powders obtainable from the various manufacturing sources differ in their D.D.T. content. Some contain as much as 10 per cent., others as little as 2 per cent. A happy medium would be about 3 per cent. for application to the body. For treating walls, cupboards, clothes, etc., the higher concentration would be employed provided there was no possibility of it being licked or gaining access to food.

The increased toxicity of D.D.T. when in oily solution makes it incumbent upon veterinarians to avoid its application to the body; and even in the spraying of kennel walls or cat cages there should be no excess which could come into contact with the animal body. Kerosine has been used as a solvent for spraying buildings, and of course the oil soon soaks into the wood, or volatilizes, leaving a dry surface. But there may be a slight increase in the risk of fire.

As previously stated, different species of animals vary in their susceptibility, man and dog being apparently fairly resistant, but cats very susceptible. Smith & Stohlman[1] ascertained that the minimum lethal dose for the cat, of D.D.T. in olive oil, administered per os, is 300 mg. (about 5 grs.) per kg. of body weight.

In the fall of 1945, Messrs. Burroughs Wellcome & Co. kindly supplied the writer with a quantity of dispersible D.D.T. powder for experimental purposes. The instructions were to add 2½ oz. of this powder (containing a wetting agent) to one gallon of water, which resulted in a 0·5 per cent. suspension of D.D.T. This liquid was used upon several badly flea-infested greyhounds with complete success. The dogs were merely sponged all over and allowed to run about until dry.

Ten grammes of 4 to 5 per cent. D.D.T. dust has been found effective in eliminating the dog and cat flea, with protection from reinfestation lasting four to seven days.[10]

Last summer and autumn brought a dreadful plague of fleas. One greyhound trainer had a flea-infested shed which, over a period of several months, had been scrubbed, sprayed and fumigated with all kinds of substances, yet still remained infested until D.D.T. suspension was used.

Those persons employed in the application of mists or dusts, etc.,

must be careful, as the inhalation of finely dispersed D.D.T. particles in the form of mists or aerosols can lead to harmful effects and death; but it seems that fairly high concentrations are necessary, and time of exposure must be long before the danger level is reached.

Cameron & Burgess[11] are of the opinion that sprays containing up to 0·5 per cent. could have serious effects only as a result of grossly careless handling. On the other hand, they are insistent that precautions are essential in handling higher concentrations, especially oily solutions.

In the treatment of D.D.T. poisoning, the first procedure is to withdraw the poison by washing it out of the coat or out of the stomach. Unless there is already a severe diarrhoea, purgation would be valuable. There appears to be no specific antidote, but sedatives and hypnotics of various kinds (*e.g.*, nembutal) have been recommended.

Kanegis & Roepke[12] state that urethane and dilantin (Epanutin) appear to be effective in ameliorating the neurologic symptoms, and that in some cases administration must be continued for two to three days. Calcium gluconate in 10 per cent. solution has been reported to relieve the convulsions.[13] Artificial feeding and support for the respiratory and circulatory systems complete all the measures that can usefully be adopted.

Gammexane

Gammexane, another of the newer insecticides, is the gamma isomer of benzene hexachloride. This also is a highly potent stomach and contact poison for insects with a low toxicity for invertebrate animals.[14] It possesses a very persistent and unpleasant musty odour. The writer sprinkled a benzene hexachloride preparation on the carpets of his car many months ago to eradicate moth, and the odour persists to this day.

Gammexane is rather quicker than D.D.T. in its insecticidal action and according to Cameron[14] is slightly more toxic than D.D.T. to animals. This author suggests that:—

"D.D.T. possesses one advantage over gammexane in that premonitory signs of intoxication due to its absorption are well defined and occur with doses well below the fatal level. We have seen no such safeguarding signs with gammexane; when symptoms appear, the end is usually in sight and little can be done to save the animal.

"Symptoms of acute poisoning with gammexane develop fairly rapidly and include the following in this order:—

1. Increased respiratory rate, sometimes very considerable.
2. Restlessness, accompanied by frequency of micturition.
3. Intermittent muscular spasms of the whole body.
4. Salivation, grinding of the teeth, bleeding from the mouth and tongue resulting.
5. Backward movement, with loss of balance and somersaulting.
6. Head-retraction, convulsions, gasping and biting.
7. Collapse and death.

"In hyperacute cases, this train of events lasts 40 to 120 minutes; more resistant animals survive 12 to 20 hours. Rarely, death is delayed for several days or even a week; the animal is then very wasted."

The same author, however, points out that skin and oral tests show that considerable amounts of gammexane can be safely applied to the skin or ingested, and "*gross carelessness would appear to be the chief source of danger with this insecticide.*"

Slade[15] quotes figures showing that crude benzene hexachloride (a mixture of the isomers) given orally to rats, is markedly less toxic than the gamma isomer, and if these figures are compared with those quoted by Cameron[14] it will be seen that the crude benzene hexachloride is significantly less toxic than D.D.T. Commercial gammexane dusting powders, intended for use on animals, rarely contain more than 5 per cent. benzene hexachloride, so that toxicity risks would actually appear to be rather less with gammexane preparations.

Lewis[16] has recorded the successful treatment of 37 cases of sarcoptic mange in dogs using a suspension made from a benzene hexachloride dusting powder. No toxic effects were observed. Apart from this record, however, documented evidence as to the safety of gammexane in canine and feline practice seems to be lacking and extended trial appears necessary. In the case of cats, their licking propensities would render them as vulnerable as they are to D.D.T. Few manufacturers have as yet marketed gammexane as an insecticide for small animals and in all probability this is due to the unpleasant odour associated with this product.

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D.D.T. and Synthetic Insecticides*

By

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The lecturer began by reviewing the position regarding insecticides before D.D.T. became available. The foremost products had been two vegetable insecticides—derris, the ground root of a shrub cultivated in Malaya, and pyrethrum, the ground flower heads of a species of pyrethrum plant grown in Japan, Kenya and Dalmatia. Both of these were excellent insecticides, but unfortunately they were destroyed by exposure to air and light and their effect was, therefore, of limited duration only. D.D.T., on the other hand, was not affected by these agencies, it was insoluble in water, and was, in fact, very persistent indeed. Not only this, but it was very easily prepared from such simple substances as alcohol, chlorine and benzene. D.D.T. was first prepared by a German chemist, Zeidler (1874), who, however, failed to reveal its effect on insects. Nor did he work out the exact chemical formula for D.D.T.; this was established for the first time by Dr. H. Martin and the lecturer in 1943.

The discovery of the insecticidal properties of the substance was made by Dr. Laüger and his team of workers in Switzerland in 1939 and was the outcome of systematic research work carried out by the firm of J. R. Geigy & Co., of Basle, ever since the end of the first Great War. The object was to find a chemical which would make silk and wool resistant to attack by the clothes moth. The substance sought would have to be colourless, yet attach itself to the fibres with the fastness of a good dyestuff. Further, it would have to be toxic when ingested by the larvae of the moth. Large numbers of compounds were tried and tested, and finally one was produced which had all the desired properties. Then came the problem, could the formula be modified in any way so that the substance would kill not only insects which swallowed it, but also on contact? For this, it was argued, the chemical would have to be made soluble in the fatty cuticle of the insect so that it could dissolve in and so produce the desired effect. Chloroform was a very efficient solvent for fats and contained a $-CCl_3$ grouping. It was therefore decided to introduce this fat-soluble grouping into the formula. The result was D.D.T.

The new insecticide was tested out against a large variety of pests by Dr. Wiesmann of the Wädenswil Research Station, Switzerland, with good results. In 1940-41 it was used most successfully in that country against the Colorado beetle, and early in 1943 D.D.T. was introduced to British and American authorities through official channels. It was interesting to record, however, that Dr. H. Martin and the lecturer heard of it independently about the same time from Dr. Maag of Zurich.

The uses of such a powerful insecticide during war were obvious. Such diseases as trench fever, malaria, sleeping sickness and typhus were insect-borne and might bring disastrous results to an army in the field. Thus, at the outbreak of the last conflict, the search for suitable preparations and methods of treatment was being vigorously pursued.

The lecturer here described the type of experiments conducted with "Lethane," an organic thiocyanate insecticide which would have been used in very large proportions but for the discovery of D.D.T.

He then went on to say that D.D.T. was not only a most excellent stomach and contact poison, but was extremely persistent. It had but slight ovicidal properties, but it persisted beyond the time of incubation of most insect eggs so that newly hatched insects usually succumbed to its contact action. It had no fungicidal properties and also it was of little use against most mites. In experiments in which

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apple trees were sprayed with D.D.T., infestations of red spider mite had become more serious owing to the fact that, whereas the mite itself was unaffected by D.D.T., predatory insects were killed. D.D.T. did, however, kill a very wide range of insect pests some at very low concentrations indeed.

D.D.T. had to be treated with some respect, however, for it was definitely toxic to man and animals. The symptoms were similar with all animals so far examined, including mice, rats, dogs, cats, rabbits, guinea-pigs, goats and baboons. It was a nerve poison and the affected animal might show fright, hyperexcitability, tremors, clonic convulsions and paralysis, depending on the dose administered. Not only was the chemical toxic when given orally, but there was considerable evidence that it could be absorbed by the intact skin if applied in oily solution. Similar effects had been noted in man. Fortunately, however, the dose necessary to produce toxic effects was relatively large and, in fact, D.D.T. dusts and watery suspensions of D.D.T. in contact with the skin were quite harmless. In the now famous Naples typhus epidemic of the winter of 1943-44, in which the whole civilian population was dusted with D.D.T., not one case of human toxicity was recorded. Such dusts taken orally were, of course, dangerous—a point to be borne in mind when using them on cats or other animals which had the habit of licking themselves.

One disadvantage of D.D.T. was its slowness of action on insects, though this could be remedied by incorporating pyrethrum with it. The rapid "knock down" of the latter chemical in a fly spray, for instance, did not necessarily imply a complete kill, but if D.D.T. was also present none of the insects recovered.

The occurrence of such outstanding insecticidal properties in such a simple chemical as D.D.T. had stimulated research on its mode of action, for if this could be established, the way was open for the discovery of new and possibly even better materials. In this connection Martin & Wain (1944a; 1944b) had suggested that, once absorbed, D.D.T. acted by elimination of hydrochloric acid around the nervous tissue of the insect. In arriving at this conclusion, a large number of substances similar to D.D.T. had been synthesized and tested and in general, only when hydrochloric acid could be readily produced from the compound was it insecticidal. It was of interest, though not necessarily analogous, that, when D.D.T. was administered orally to animals, a breakdown product was excreted in the urine which could only be formed from D.D.T. by loss of chloride.

Certain workers in America had based their researches on that theory since its outlines were published, and already it had led to the discovery of a new insecticide, "Velsicol 1068," reported to be four times as deadly as D.D.T. to house flies.

At this point the lecturer went on to discuss the other well-known synthetic insecticide—"Gammexane," sometimes referred to as benzene *hexa*chloride or "666." This substance, made by treating benzene with chlorine in ultra-violet light, was first prepared by Faraday in 1825. Its marked insecticidal properties, however, were only discovered in recent years. It was now known to have been used both in France and in Germany during the war. In this country its properties were discovered independently by research workers of Imperial Chemical Industries, Ltd., who had also carried out extensive investigations, both on the substance itself and its performance as an insecticide. The crude product consisted of a mixture of at least four separate materials, one of which, given the name "Gammexane" by I.C.I., was a substance of outstanding insecticidal activity. Unfortunately the crude material had an objectionable smell which limited its use for certain purposes, but it was hoped that this would be greatly reduced in the purified preparations which might become available. As an insecticide gammexane was very similar to D.D.T., acting as a nerve poison and producing similar symptoms. Further, since it was fat soluble and lost hydrochloric acid with great ease, it fulfilled the requirements for mode of action demanded by the theory of Martin & Wain. Slade (1945), however, had suggested that gammexane acted by masquerading in the insect's body as another chemical, inositol, which was vital in metabolism. Such theories, if backed by sound experimental evidence, were invaluable in the search for better materials, and in the next few years it would not be surprising if even more spectacular results in these directions were achieved.

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Weekly Wisdom

The general practitioner's intimate knowledge of the patient is the greatest force in both curative and preventive medicine. There are doctors for patients even more certainly than there are horses for courses.—Lord Woolton (Inaugural Address to students, Westminster Hospital Medical School).

Parasitological Considerations

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I once knew a very little girl who was heard by her daddy to try to pronounce the difficult word "veterinary"; when her daddy told her what he thought it ought to be he added: "and your daddy is a veterinary surgeon"; whereupon the little girl exclaimed, with the combination of innocence and wisdom that belongs to the very young, "Poor daddy"! On my way home after hearing of this profound utterance I naturally began to think along the lines of "poor me"; but being a veterinary parasitologist, was I not, perhaps, even more to be pitied? Might it not be that my subject could be regarded as parasitic itself, figuratively speaking, perhaps as "a parasite on the anus of science"—a description that I had once heard applied to a bacteriologist?

This led me on to a general cogitation on parasitology and bacteriology, and to drawing comparisons between these two highly specialized branches of biological science. The events of the past two or three days began to pass through my mind and I recalled a remark recently made by one of my more critical colleagues, who had said "but isn't he rather woolly even for a veterinarian?" and I thought of those references one occasionally sees to the *art* of veterinary medicine. So where were we, flourishing bacteriologists and impoverished parasitologists, flourishing because so numerous, and impoverished because so few? Were we scientists at all, and how did we compare?

On the level of aesthetic appeal to the ordinary human being, or the ordinary veterinary graduate, I had to admit to myself that the bacteriologists had the pull. Their beautiful glassware of limitless variety, the mystic appeal of their multi-coloured cotton-wool plugs, their vacuum pumps, and the whole of their wonderfully perfected and standardized *in vitro* technique; how could the helminthologist compete with that array when much of his time is spent in investigating the unmentionable excrements of the animal body?

But, coming down to serious considerations, may not this comparison on aesthetic grounds have considerable importance, since, unfortunately, it is the superficial first impression that determines the veterinary undergraduate's choice of subject for future specialization? Possibly this factor is responsible, in no small degree, for the relatively small number of graduates wishing to take up parasitology as compared with those who wish to take up bacteriology; a difference which might perhaps be cleared away by the introduction of more living parasites into the parasitology course, to enliven for the student what too often proves to be a depressing sequence of diagrams and dead parasites in museum cases and slide cabinets.

Continuing with the comparison one may ask whether this far fetched specialization in bacteriology is altogether good? Perhaps the subject has become too separate? Anyone who works with helminths or with any of the large parasites may still be called a "parasitologist," but no one would think of applying that term to a worker in bacteriology, although the relationship to parasitology is every bit as close as in the case of helminthology, both subjects being children of the same parent, or species in the same genus. We have very good reason to lament the disappearance of the *Naturalist*, who in former days took a wide view of every living thing: the *Parasitologist* as a separate entity is doubtless doomed to go the same way, but the need for a wide culture in the real understanding of ultimate detail remains.

A further interesting comparison might be drawn between the relative positions of the present research fields in bacteriology and in parasitology with regard to the assistance they give to the better understanding of disease in man and in animals. My more general reading recently guided me to the discovery of an anonymously written poem dealing with the subject. The poem claims to be the shortest in the English language, but it is full of meaning for the parasitologist. Its title is *On the Antiquity of Parasitism*, and the complete poem as follows:—

Adam
Had 'em.

Supposedly, he must have "had 'em"; so, at least, our fathers believed; the tapeworms and the hookworms, the sarcopts, the lice and all the rest of the parasites that are specific to man; but surely he could not have had all that vulgar, killing rabble of bacteria too? No, that would have been too much even for our fathers to believe. It might, perhaps, be of some value to consider the bacteria, with their fluctuations of virulence, as relatively new parasites; amateurs whose adaptations to host are still only half formed. In the understanding of group diseases the research field of parasitology, and particularly the field of helminthology, has certain advantages to offer, advantages that are not fully appreciated by the workers in epidemiology and in immunity.

There is a wealth of meaning in that little poem. If one looks back along those vistas of evolutionary development, what a long way it is to the place where these old relationships began, and for what an immense period these hosts and parasites have developed together, genus to genus and species to species. These animal associations have provided the biologists with invaluable information in the classification of hosts, notably of certain groups of birds, the obscurities of whose relationships were finally made clear through a study of their parasites. These ancient associations have also a historic story to tell on the place of origin of various vertebrate species, on the wanderings of the early races of man, on the migrations of birds and in answering such a question as to whether the salmon was originally a fresh water fish that took to the sea, or a salt water fish that took to the rivers.

The size of the larger creatures with which the parasitologist has to deal is also an aid to certain points of understanding in that these parasites can be considered as individuals. For example, that the presence of the parasite does not necessarily imply a diseased condition of the host is self-evident to the helminthologist, but has been a point of hard-won understanding for the bacteriologist. The importance of ecology, and of understanding the complete relationships of a parasite with the various components of its environment without, as well as within the animal host, is also more obvious to the parasitologist than to the bacteriologist, to whom, however, its significance is none the less real.

Another example of a point that readily suggests itself to the parasitologist though not to the bacteriologist, is the possibility of there being a difference between resistance to a parasite and resistance to the effects of parasitism, as recently observed in scabies in the human being, where certain of the lightly infested cases suffer much more severely than do some of the heavily infested ones.

These are examples of the advantages of the parasitologist's viewpoint, but comparatively little use had been made of them for the furthering of our knowledge of group diseases and spreading diseases. Although bacteriology is far more advanced in the field of immunology than is parasitology, it is none the less clear that if only some of the time and ability devoted to bacteriological immunity had been spent in a wider investigation of host-parasite relationships we might have been further along the road of understanding than we are at the present time.

It is permissible, I think, very occasionally to indulge in comparison of this kind and this note cannot be completed without considering the relative economic importance of bacteria and viruses which have received so much attention, as compared with the gross parasites and protozoa which have received so little. The first thought that naturally comes is of the great plagues and pestilences; of sudden death and of the black smoke from piles of burning cattle. This thought, however, is not of economic loss alone, but in actuality is a consideration of the drama of disease. We may suppose, perhaps, that the real question to be answered concerns the infectious diseases that are of most trouble to the veterinary practitioner, the answer, presumably, being mastitis, contagious abortion and tuberculosis. Perhaps even that is not the proper question to put concerning the relative extent of the losses to farmer and to country from these various groups of diseases. One may suppose that, were the female bovine and her troublesome mammae to be eliminated many of the bacteriological troubles would disappear; yet there is a truly frightening group of parasitic diseases the general loss from which must be very great indeed: parasitic gastritis, the most important of all diseases of sheep; fascioliasis, which comes a very good second; sheep maggot fly, considered to be the greatest cause of loss among hill sheep; strongylosis of equines, the worst disease from the horse breeder's point of view; hoose in cattle, quite the most troublesome disease of young cattle in many parts of the country; sheep scab, entailing the considerable expense in policing and dipping throughout the country; the constant serious loss to the leather industry and to agriculturalists from the ox warble fly; 1,500 tons of bovine livers condemned yearly because of liver fluke infestation: that is surely a notable list of ever-present diseases affecting stock in tens of thousands and hundreds of thousands.

An article by Mohler, Wright, MacKellar & Bishopp on the economic importance of animal disease to the United States, appearing in the introductory part to the widely read war-time volume of papers published under the title "Keeping Livestock Healthy," gives the following list of estimated losses in the United States:—

Internal parasites	$125,000,000
External parasites	85,000,000
Cattle grubs	65,000,000
Poultry diseases (except tuberculosis and those caused by parasites)	40,000,000
Brucellosis of cattle	30,000,000
Mastitis	19,000,000
Hog cholera	12,500,000
Tuberculosis (cattle, swine and poultry)	10,500,000
Swine abortion	10,000,000
Stable fly and horn fly	10,000,000
Screw-worms	5,000,000
Cattle and sheep scabies	1,000,000
Encephalomyelitis	1,000,000
Swine erysipelas	1,000,000
Anthrax	750,000
Johne's disease	500,000
Haemorrhagic septicaemia	500 000
Goat lice	500,000
Cattle tick fever	400,000
Rabies	250,000
Anaplasmosis	100,000
Total	$418,000,000

Although fully aware of some justification for referring to such figures as "guesstimates" they are, nevertheless, an outcome of the best available information. We in this country are certainly no better off than are the people of the United States over the matter of parasitic disease. Ought we not to conclude that something should be done about it?

ABSTRACT

[Some Aspects of the Pharmacology of D.D.T. MEYER JONES, L. (1946.) *N. Amer. Vet.* **27**. 492-494.]

The degree of toxicity of D.D.T. depends upon the form and amount of the substance available for absorption by the tissues. Oily sprays are readily absorbed by the skin, but there is no absorption of the powder by the skin and very little by the intestine, although ingestion of large doses of powder will be toxic. An aqueous suspension of D.D.T. is also of low toxicity by either route of administration. Acute poisoning with D.D.T. is possible, due to the accidental ingestion of large amounts of the drug, but chronic poisoning is far more probable as a result of the daily ingestion of external applications, especially if these are in the form of an oily solution. The symptoms of D.D.T. poisoning resemble those of phenol poisoning except for the delayed onset and persistence of effect. There is no specific antidote, and cases of D.D.T. poisoning have been treated successfully by the administration of central nervous system depressants and calcium gluconate intravenously.

It has recently been found that D.D.T. or a toxic derivative is excreted in the butter fat of milk of dogs and goats, even when the animal shows no clinical signs of toxicity. It is not yet known how small a quantity of D.D.T. can be ingested before appreciable amounts of it or its toxic derivatives are excreted in the milk, and thus it is advisable to use D.D.T. sprays on and around milking cows with great care, for they may ingest large quantities of the drug by licking themselves and their surroundings.

M. L. B.

No Harm from Nitrogen.—There is no scientific foundation whatever for the allegation that the effects of the continued use of artificial nitrogenous fertilizers are harmful, provided they are used in conjunction with other necessary plant foods. It is true that on light land continuous heavy application of sulphate of ammonia will deplete the lime content of the soil, and this should be corrected by occasional dressings of lime. Also on certain types of heavy land too much nitrate of soda will make the soil sticky and difficult to work, and it is then advisable to change from nitrate of soda to some other form of nitrogenous fertilizer.

Nitrogenous fertilizers, especially sulphate of ammonia, are often accused of "drawing the land." This is certainly not the case. What does happen is that the use of any nitrogenous fertilizer leads to heavier crops, and these naturally take up more phosphate and potash from the soil than light crops. When it is thought that the land is being "drawn," the policy should be, not to omit nitrogen, but to supply more of the other necessary plant foods.

No chemical fertilizers, however, can supply humus, one of the most important factors of soil fertility. Artificial fertilizers should be used, not as a substitute for organic and humus-forming manures, but in addition to them.—*Min. Agri. News Service.*

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Solutions of the soluble sodium salts of sulphathiazole and sulphadiazine are very alkaline; the *p*H is 10·6 and 10·0 respectively. In consequence there is a grave danger that if injected intrathecally they will cause death.—*Pharm. J.*

THE VETERINARY RECORD

October 26th, 1946

D.D.T. AND GAMMEXANE IN SMALL-ANIMAL PRACTICE

THE opening articles of this issue sound a timely warning of the potential dangers attending the indiscriminate use of the new insecticides upon small animals. A great deal of publicity has resulted from the development of these powerful insecticides—particularly D.D.T.—and it is not surprising that the end of the war has seen the marketing of very numerous insecticidal preparations. Many of these are produced by reliable firms and the amount of the active principle is clearly defined : on the other hand, preparations are now available of varying content and strength issued by " mushroom " firms, some of which are more concerned with rapid and expansive sales of products to a gullible public than with their efficiency or safety. We find, in fact, almost every chemist, corn chandler, or general store stocked up with D.D.T. preparations, easily purchasable and indiscriminately used upon animals, numbers of which are unfortunately finding their way to veterinary infirmaries.

Whilst dusts and aqueous suspensions in reasonable strengths may undoubtedly be safely applied to the skins of dogs and cats, it must be realized that any animal which incessantly licks its coat may ingest an overdose of the drug and exhibit toxic effects. In addition, when kerosene or other oils are used as solvents, then absorption through the skin is facilitated and poisoning may result. It is well that canine practitioners should be aware of these facts and be able to advise their clients accordingly.

REVIEW

["**The Manual of Veterinary Routine.**" S. Agyen-Frempong (1944.) Accra, Gold Coast: Govt. Printing Dept. [36 pp.]

This booklet is written by an African Veterinary Assistant of the Gold Coast Veterinary Service.

There are five main parts: Bacteriological Methods (pp. 5-15); Infection, Immunity and Manufacture of Laboratory Products (pp. 16-23); Culture Media and Culturing (pp. 24-25); Tests (pp. 26-27), and an Appendix (pp. 27-35). There is also a very useful index.

The booklet, which includes 16 illustrations, deals with laboratory methods that the African staff of the department should know for their routine duties. The matter dealt with is all of a practical nature and routine laboratory procedures are explained concisely and clearly. They include the collection and despatch of blood for anthrax diagnosis, sterilization of materials and apparatus, filtration, the preparation and examination of blood smears, staining, section cutting, egg counts in faeces, hyper-immunization of cattle in rinderpest serum production, extraction of blood serum, the preparation of vaccines against bovine contagious pleuro-pneumonia, rabies, and fowl pox, the agglutination test for brucella infection, and microscopic diagnosis of trypanosomiasis, piroplasmosis, anaplasmosis, spirochaetosis, rabies and certain other diseases.

Tables are given of data used in immunization against certain common diseases, the preparation of common reagents and dosages and methods of use of certain drugs used for the treatment of protozoan infections.

The author and the department are to be congratulated on the production of this useful manual. In a future edition consideration might be given to production in a more convenient folio size: crown quarto would be suitable.

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Mr. James Turner, who has been President of the National Farmers' Union for two years, has been unanimously recommended by the Council for reappointment as President at a salary of £5,000 a year.

CLINICAL COMMUNICATIONS

Toxic Effects of D.D.T. on a Cat

HELEN NEVE, M.R.C.V.S.

Northwood, Middlesex.

The subject of this communication is my neutered female ginger cat, aged 12 months, and weighing 8 lb. There was an early history of *B.H.S.* infection, which had responded to treatment.

I washed the cat with one quart of a 0·5 *per cent. suspension* of D.D.T. in water, with a little common soap as lather. After its bath the cat lay in the sun, drying; occasionally it licked its coat. About four hours later the symptoms began. The cat's head was very rapidly shaken by spasms of the neck muscles; the muscles of the back and tail twitched, noticeably the tip of the tail. The hind legs, and to a less degree the fore legs, were in tremor. When placed on its feet, the cat had difficulty in walking. At each step the hind leg was jerked-up in full flexion, and vigorously shaken; the action was not unlike that of a horse with stringhalt. Each fore leg was vigorously shaken before the foot was placed on the ground. After about six paces had been taken the gait became almost normal. The cat was able to jump, although she hesitated before taking off. These spasms and tremors recurred whenever the cat attempted to walk after resting. When resting the only abnormal movement observed was a twitching of the ears. She was dull and disinclined to drink, but she ate her food normally. Her temperature was normal and I failed to detect any hyperaesthesia or to induce any of the spasms by light or brisk stimuli.

On the second day there was no perceptible improvement, so I thoroughly rinsed her coat with warm tap water. Immediately the severe symptoms of the first day recurred. The cat was dried in a basket before the fire. She lay apparently unable or unwilling to move for about eight hours, after which she improved slightly. However, on attempting to walk, all the spasms and tremors of the first day recurred in a very severe form.

On the third day there was a general improvement; the spasms were declining in quality and duration. But in the evening, immediately after eating some raw horse meat she had a recurrence of the symptoms as severe as on the first day. Slight symptoms persisted to, and included the fifth day, after which the cat appeared to make an uninterrupted recovery.

Comments. Two of my clients reported that on shampooing their two dogs with 0·5 per cent. suspension of D.D.T. in water, " there was great irritation of the skin," and flare-up of their dermatitis which lasted for about 24-36 hours. I had previously washed, without any detrimental effects, a three-year-old long haired tabby cat with the same preparation and technique as I used for my own cat. At the time of washing, my cat showed no sign of dermatitis.

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D.D.T. Poisoning in a Cat

H. C. P. KING, M.R.C.V.S.

Kennington

Subject.—White short-haired male cat, two years old; flea infested. Cat was immersed in a 0·5 per cent. suspension D.D.T. (dispersable powder) prepared as instructed. This was done last thing at night, and on the following morning, Sunday, the cat showed most alarming symptoms.

Sunday: Marked inco-ordination of limbs, generalized convulsive muscular tremors, rapid and continuous blinking of eyelids, dilated pupils, general collapse, tail erect and rigid.

Monday, a.m: Completely off its legs, muscular tremors continuing, marked hyperaesthesia, temperature 102° F.

Monday, p.m.: Regaining ability to stand, thirst for water, hyperaesthesia less marked, movements jumpy.

Tuesday, a.m.: Considerable general improvement, able to walk more decisively but apparently unable to focus objects in its path.

Tuesday, p.m.: Almost normal; eating, drinking, sleeping and bowels normal.

Treatment.—Glucose in strong coffee with added milk, warmth—blankets and hot water bottles.

General Observation.—Whether this cat possessed a special idiosyncrasy to D.D.T. I do not know; nor is it possible to say whether the toxic symptoms were the result of absorption or ingestion.

A Rural Life Conference will be held under the auspices of the Church Missionary Society at High Leigh, Hoddesdon, Herts., January 7th to 10th, 1947. Eminent speakers will handle the topics, which will be followed up by a group discussion in commissions. Application for registration form should be made to the Acting Secretary, Rural Life Conference, C.M. House, 6, Salisbury Square, E.C.4.

QUESTIONS IN PARLIAMENT

British Army: Veterinary and Medical Officers (Pay)

Mr. Rees-Williams asked the Secretary of State for War what reason there is for the discrepancy in the rates of pay as between officers in the R.A.V.C. and officers in the R.A.M.C.

The Secretary of State for War (Mr. Bellenger): The responsibilities of officers of the Royal Army Veterinary Corps are not of so wide a character as those of medical officers, and the new scales of pay reflect this difference of responsibilities.

Mr. Rees-Williams: As the Secretary of State for War has eliminated the difference between rates of pay in respect of Army trades, why does not he do the same thing in respect of Army professions?

Mr. Bellenger: The answer is not so easy as the supplementary question implies. It is not a matter entirely for the Army.

Sir Waldron Smithers: The closed shop.

Mr. Bellenger: It is a matter for all Service Departments, and there is some civilian guidance on this point. I can assure my hon. Friend that our procedure is in accordance with civilian work.

Mr. York: Would not the War Office give a lead to the Government upon this matter so that in future we may have some steps taken which are very necessary but which are now lacking?

Mr. Bellenger: I do not think it wise to give a lead to anybody, if to do so might create an undesirable precedent.

Sir Ronald Ross: Is the right hon. Gentleman not aware that the veterinary's job is much more difficult than that of the R.A.M.C. as he gets far less help from his patients?

Mr. Bellenger: I, of course, have no practical experience of this matter, and therefore I have to be advised by those who know.

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Scientific and Veterinary Staffs (Colonies)

Mr. Janner asked the Secretary of State for the Colonies to what extent salaries for scientific and veterinary staff in the Colonies are to be increased so as to have a proper relationship between the increased salaries now being paid to such staff in the British Civil Service; and whether in view of the urgent need for recruiting sufficient scientific and veterinary staff for the Colonies at the earliest opportunity, he can make a statement that will facilitate such recruitment.

Mr. Creech Jones: I can assure my hon. Friend that the recruiting needs of the scientific and veterinary staffs of the Colonies are very much in my mind, and I fully recognize the importance of offering fair and adequate terms if those needs are to be satisfied. Most Colonial Governments have recently been reviewing their salary schemes or are about to do so, and in these reviews full regard is paid to the salaries prevailing for comparable posts in the home Civil Service. Home salaries are, of course, only one of the many factors that arise in these Colonial salary reviews. Regard must also be had to the rates of pay of one technical service in a Colony as compared with another. But I am alive to the question of facilitating recruitment.

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Diseases of Animals (Control) (Scotland)

Colonel Gomme-Duncan asked the Minister of Agriculture why orders and regulations regarding foot-and-mouth and other animal diseases in Scotland are issued by the Minister of Agriculture and not by the Secretary of State for Scotland.

Mr. T. Williams: The Orders in question are made under the Diseases of Animals Acts, the administration of which throughout Great Britain is vested in one Minister because of the special importance of unified control in these matters.

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Bovine Tuberculosis

Lieut.-Colonel Sharp asked the Minister of Agriculture whether the months of delay in the identification of a tuberculous cow in a herd suspected of having caused bovine tuberculosis are due to unavoidable technical reasons; and whether he will exercise his powers under the Food and Drugs (Adulteration) Act, 1938, and order immediate pasteurization of the milk from that herd.

Mr. T. Williams: Where tubercle bacilli are found in a bulk sample of milk taken in a consuming area, the offending cow, if still in the herd, is usually detected very quickly, but in a small minority of cases there may be some unavoidable delay, due to the need for biological tests. The point raised in the latter part of the Question is, however, under consideration by the Departments concerned in connection with the revision of the Milk and Dairies Regulations.

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National Agricultural Advisory Service

Mr. Swingler asked the Minister of Agriculture whether he will make a statement on the progress of the National Agricultural Advisory Service.

Mr. T. Williams: The National Agricultural Advisory Service was formally established on October 1st, which I had prescribed as the appointed day for the purposes of Section 1 of the Agriculture (Miscellaneous Provisions) Act of 1944. Some 1,500 candidates have been selected for appointment by selection boards set up by the Civil Service Commission and have been notified accordingly. Those with rights of transfer from other employment under the Act of 1944, numbering some 300, were transferred and given notice of posting on October 1st, and like notice has since been sent to the rest of those selected for appointment. The senior officers of the service were appointed earlier and are all at their posts.

New office and laboratory accommodation has had to be found for the provincial centres of the new service, and owing to the building position will take time to complete. Meanwhile temporary accommodation has been sought where necessary, while a number of universities and agricultural colleges have generously continued for the time being to house some of the specialist advisers who have previously been members of their staffs. Because of accommodation difficulties and, even more, the shortage of qualified men and women in several fields of advisory work, some little time will necessarily elapse before the service is completely staffed and equipped and in full operation, but every effort will be made to recruit the service up to the desired strength as soon as possible.

Mr. Emrys Roberts asked the Minister of Agriculture the annual estimated cost of the new National Agricultural Advisory Committee.

Mr. T. Williams: The cost of the National Agricultural Advisory Service for its first year's working is estimated at £1½ million. Much of this expenditure represents provision for advisory work which has hitherto been carried out by the University departments, agricultural colleges and local education authorities, the responsibility for which has now been taken over by the new Service.

Mr. Emrys Roberts asked the Minister of Agriculture the relationship between the new National Agricultural Advisory Service and the county W.A.E.C.s.

Mr. T. Williams: There will be the closest co-operation between the National Agricultural Advisory Service and the County War Agricultural Executive Committees, and in each county the local staff of the Service will be integrated with the non-advisory staff of the Committee under the control of the Committee's executive officer, who will normally be also the County Advisory Officer of the N.A.A.S. The invaluable activities of the Committees in advisory and technical development work since 1939 will, I hope, be continued and extended in association with the N.A.A.S. so that full advantage may be taken of the practical knowledge and experience possessed by Committees of local farming conditions and needs. I shall look to them to sponsor the work of the Service among farmers and to encourage them to make full use of the facilities provided for their benefit.

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Contaminated Crops and Stock (Enquiry)

Mr. Snadden asked the Secretary of State for Scotland (1) if he will now give the findings of the expert committee enquiring into the causes of the deaths of cattle and sheep resulting from alleged gas poisoning.

(2) how many cattle, sheep and other livestock and poultry in the counties of Perth and Stirling have been reported as suffering from, or as having died from, or as possibly contaminated by, gas or other poisoning since June 25th, 1946.

(3) what quantities of wheat, barley, oats or other grain crop, hay or silage are at present held in quarantine in the counties of Perth and Stirling pending a decision whether they are fit for use as a result of suspected poison gas contamination; and what acreages of pasture are deemed to be unsuitable for grazing from the same cause.

Mr. Westwood: At a conference held in Edinburgh early in July of this year between representatives of interested Departments ways and means were considered of minimizing the damage caused to agriculture in parts of Perth and Stirling by the burning of surplus war stores in the late autumn of 1945, and it was agreed that tests should be carried out to ascertain to what extent crops and grazings had been affected. Pending the outcome of these investigations, farmers in the area were advised to harvest their crops, including hay, in the usual way, but not to make use of them until the results were known. A series of tests was devised, involving the grazing of healthy cattle on farms where animals had been seriously affected. Samples of hay from similarly affected farms were also fed under experimental conditions to a number of healthy cattle in Edinburgh. These tests will be completed very shortly. All the cattle used in the experiments remain healthy and it is confidently expected that both crops and grazings will be shown to be free of contamination, but until *post-mortem* examinations have been com-

pleted, a final assessment of results cannot be made. As soon as it has been made, farmers in the area will be advised whether any further observance of precautions is necessary.

There are no figures available to show what quantities of crops are being held back by the farmers pending this announcement, nor what acreage of grazings is similarly affected. It is understood that no fresh stock has become affected since June 25th, 1946, but a few additional cases, apparently affected at an earlier stage, have been reported and investigated since that date.

Mr. Snadden asked the Secretary of State for Scotland what information he has received of human beings suffering from sickness or ill-health attributable to gas poisoning in those areas of the counties of Perth and Stirling where ammunition is, or was, in storage.

Mr. Westwood: Only one complaint of the kind has reached me and on investigation it was not substantiated.

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Medical Research Council (Staff)

Major Vernon asked the Lord President of the Council the numbers of staff employed by the Medical Research Council, and the salaries paid in the categories, administrative, scientific, permanent staff paid weekly and temporary staff paid weekly.

Mr. H. Morrison: As the answer contains a number of figures, I propose, with permission, to circulate a statement in the Official Report.

Following is the statement:—

Staff Employed by Medical Research Council

	Numbers.	Salaries. £
Administrative Officers	10	590–2,750
Scientific staff, including qualified assistants ...	204	300–2,500
Other staff paid monthly	171	250–750
Established staff paid weekly	63	Under 250
Temporary staff paid weekly (mainly under age 21)	96	Under 250

In addition, there are 15 scientific officers and eight temporary staff paid weekly employed on a part-time basis, with salaries *pro rata* within the ranges given above.

Major Vernon asked the Lord President of the Council if the staff employed by the Medical Research Council are free to join trade unions and participate in union activities, as are civil servants.

Mr. H. Morrison: Yes, Sir.

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Greyhounds (Imports from Eire)

Mr. P. Freeman asked the President of the Board of Trade the number and value of greyhounds imported into this country from Eire for the four years ended 1944; the estimated number and value for 1945; and whether, in view of the undesirability of using sterling in the purchase of greyhounds, in view of our £400,000,000 sterling debt to Eire, he will take steps to prevent it.

Sir S. Cripps: During the four years ended 1944, 12,969 greyhounds were exported from Eire to the value of £915,179, most of them to this country. In 1945, Eire exported 7,517 greyhounds, valued at £733,277. Under an open general licence granted in December, 1945, live quadrupeds consigned from any part of the British Commonwealth can be imported without the necessity for individual import licences. I am not at present prepared to exclude greyhounds consigned from Eire from this general concession.

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Motor Spare Parts (Doctors)

Lieut.-Commander Hutchison asked the Minister of Transport whether he will arrange for priority in the supply of spare parts to doctors and others to whom the use of a motor-car is essential in their daily business.

Mr. Barnes: There is no general control over the distribution and sale of spare parts, but for certain makes the regional maintenance and certifying officers issue spares shortage certificates to assist the owners of vehicles engaged on essential work in obtaining spare parts which are in short supply. For other makes the manufacturers have stated their ability to meet demands without the assistance of this scheme.

BLOODSTOCK FOR INDIAN PRINCES

On Wednesday of last week racehorses worth a total of £250,000 sailed for Bombay from the London docks in charge of a veterinary surgeon. The horses, comprising some of the country's finest bloodstock, have been bought for breeding purposes in the luxury stables of a number of Indian princes including the Gaekwar of Baroda and the Maharajahs of Kashmir, Jaipur, Idar and Bahavnager. On board the B.I. liner *Queda*, which is conveying the horses, special compartments in the shelter decks have been fitted with lighting and ventilation.

NOTES AND NEWS

Diary of Events

Oct. 30th.—Meeting of the Scottish Metropolitan Division, N.V.M.A., at the Royal "Dick" Veterinary College, 2.30 p.m.

Oct. 30th.—Meeting of the West of Scotland Division, N.V.M.A., at Glasgow (Ca'dora Restaurant, Union St.), 2.15 p.m.

Oct. 31st.—Meeting of the Lancashire Division, N.V.M.A., at Manchester (Grand Hotel), 2.30 p.m.

Oct. 31st.—Meeting of the Derbyshire Division, N.V.M.A., at Sutton Bonington (Midland Agricultural College). 2 p.m.

Nov. 2nd.—Joint Discussion Meeting of the Biochemical Society and the Society for General Microbiology, in the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, 11.15 a.m.

Nov. 4th.—Meeting of the Farmers' Club at the Royal Empire Society, 2.30 p.m. (Mr. J. G. Stewart: "Protein Food Production.")

Nov. 5th.—R.C.V.S. Animal Management Examination, commencing in London.

Nov. 5th.—Meeting of the Southern Counties Division, N.V.M.A., at Eastleigh (Four Counties Bacon Factory). 1.45 p.m.

Nov. 7th.—Meeting of the Central Veterinary Society, at the Royal Veterinary College, Camden Town, N.W.1, 2 p.m.

Nov. 7th.—Meeting of the Dumfries and Galloway Division, N.V.M.A., at Dumfries (Station Hotel), 2 p.m.

Nov. 8th.—Meeting of the Mid-West Division, N.V.M.A., at Bath ("The Red House"), 2.15 p.m.

Nov. 8th.—Meeting of the N.V.M.A. Overseas Services Committee, at 36, Gordon Square, W.C.1, 2 p.m.

Nov. 9th.—Annual Meeting of the Society of Women Veterinary Surgeons, at the Holborn Restaurant, High Holborn, W.C.2, 11.15 a.m. As indicated in our Notices Column, luncheon in the Restaurant will be followed by an X-ray talk and demonstration by Mr. Gordon C. Knight, at the Royal Veterinary College.

Dec. 3rd and 4th.—R.C.V.S. Written Examinations begin.

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New Appointments to the Staff of the Ministry of Agriculture

As notified in recent issues, Council, N.V.M.A., has decided that no advertisements for appointments to the veterinary staff of the Animal Health Division of the Ministry of Agriculture shall be accepted for *The Veterinary Record* pending the settlement, in a manner satisfactory to the Association, of the question of the status and salaries of the Veterinary Officers of the Division.

In the meantime, any members of the profession who may, nevertheless, contemplate applying for such posts, should these be advertised elsewhere, are requested first to communicate with the General Secretary of the Association at 36, Gordon Square, London, W.C.1.

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Supply of Penicillin to Veterinary Surgeons

An amendment of the Control of Penicillin (No. 1) Order will come into force on November 1st, 1946.

This amendment will place veterinary surgeons on the same footing as registered medical or dental practitioners as regards the acquisition and disposal of penicillin.

The present procedure whereby veterinary surgeons obtain their penicillin through specially licensed suppliers will terminate therefore on October 31st.

There is, however, no necessity for a veterinary surgeon to disturb his present arrangements for securing penicillin, but this amendment of the Order does enable him to change his source of supply after October 31st should he so desire and to do this without reference to the Ministry of Supply. It also means that the scheme whereby forms of application (Form P.P.C./5) for obtaining supplies of penicillin were issued by the N.V.M.A. will be discontinued on October 31st.

PERSONAL

Mr. R. Daubney's Appointment as Chief Animal Pathologist and Veterinary Adviser to the Egyptian Government

Mr. R. Daubney, C.M.G., O.B.E., is retiring from the Colonial Veterinary Service, and has been appointed Chief Animal Pathologist and Veterinary Adviser to the Egyptian Government.

Mr. Daubney was 21 years in Kenya, joining the service in 1925 as Assistant Chief Veterinary Research Officer. In 1932 he became Chief Veterinary Research Officer, and in 1937 on the separation of the Agricultural and Veterinary Departments he became Director of the new Department of Veterinary Services, which was based on the Research Laboratory at Kabete. Under his direction the Kenya Veterinary Department rapidly earned the respect of both European and African stockowners, and considerable progress was made in the organization and development of the livestock industry in Kenya.

In September, 1939, Mr. Daubney was appointed Director of the Central Veterinary Research Institute which was housed in a portion of the Kabete Laboratory, but the outbreak of war prevented the immediate development of this new East African Institute. Mr. Daubney has always been a strong advocate of the regional method of organizing research in the Colonies, and in 1944 he was chosen to express East African views on this issue to the Colonial Research Committee in London.

For the greater part of the war years Mr. Daubney, among his other activities, was Livestock Controller in Kenya, establishing an organization for the physical control of all meat supplies for canteen and military consumption, which was in fact a vast business concern with a turnover of about a million sterling.

Mr. Daubney came to England in June this year as leader of the East African delegation to the Royal Society's Commonwealth Scientific Conference, and also represented East Africa at the Official Scientific Conference which followed the Royal Society's Conference. These two conferences were followed by another official conference to review the work and organization of the Imperial Agricultural Bureaux.

About the middle of August, Mr. Daubney, in response to urgent representations from the Egyptian Government, cancelled a trip that he was about to make to Canada and the U.S.A. on behalf of the Colonial Research Committee and flew to Egypt to investigate difficulties that had arisen in the immunization of cattle against rinderpest, which is one of the most serious problems facing the Minister of Agriculture at the present time. He returned by air to England at the end of September, having accepted the new post of Chief Animal Pathologist and Veterinary Adviser, and is at present engaged in the purchase of plant and equipment for the new Research Institute which is to be built in Cairo.

He returns to Egypt early in November to take up his new duties.

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Marriage.—TURNER—ABRAMS.—The wedding took place at St Mary's Church, Theydon Bois, on October 5th, 1946, between Richard S. Turner, only son of Mr. and Mrs. F. S. Turner of Great Brickhill, Bucks, and Audrey M. Abrams, M.R.C.V.S., youngest daughter of Mr. C. W. Abrams, M.R.C.V.S., and Mrs. Abrams, of Theydon Bois, Essex.

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Diamond Wedding.—We extend hearty congratulations and good wishes to Mr. and Mrs. H. R. Grubb, of "Oaklands," 12, Sanderstead Hill, Sanderstead, Surrey, who celebrated their diamond wedding on Wednesday last. Mr. Grubb is Senior Director of the firm of H. R. Grubb, Ltd., Croydon, printers of *The Veterinary Record* and the *Journal of Comparative Pathology & Therapeutics*, he having founded the business 57 years ago.

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R.C.V.S. OBITUARY

STEWART. Robert Dewar, 4, Church Street, Modbury, Nr. Ivybridge, S. Devon. Graduated Glasgow, July 17th, 1940. Died October 14th, 1946; aged 30 years.

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THE LATE ROBERT D. STEWART, M.R.C.V.S.
A Tribute

By the untimely death of "Bob" Stewart the profession has sustained the loss of yet another young veterinarian whose career was so full of promise.

When I first knew him in 1941 I quickly learned with what facility he was able, by his ability as a practitioner, to gain the confidence of the farming community. At this time of struggle for recognition, the profession can ill afford to lose young men such as he, who would have done so much to uphold its reputation.

The deepest sympathy of their many friends is extended to his wife Betty, and their small son, Douglas.

T. L. G.

Centre for Research into Canine Diseases to be Established

At a Press conference held on Tuesday last, it was announced by the Scientific Director for the Veterinary Educational Trust, Dr. W. R. Wooldridge, that active negotiations are proceeding for the establishment of a station for investigating the diseases of greyhounds and other dogs. As our readers are aware, the Trust already is organizing an Equine Research Station at Newmarket, with Professor Wm. C. Miller as Director, and this further extension of the Trust's activities is now being rendered practicable by the generous action of the National Greyhound Racing Society in guaranteeing the sum of £10,000 per annum for seven years towards the establishment and maintenance of a Canine Diseases Research Centre. It is understood that the Station, which will cover the whole field of investigation into the diseases of dogs, will be situated in the South of England—probably within a short distance of the North London region.

The Duke of Norfolk, President of the Trust, said that these research stations, with others to follow where they were needed, were being developed to stimulate original research and to offer careers to those who wish to specialize. Facilities for specialization were few, but every type of animal should have behind its veterinary service a specialized one. Originality in research and independence of thought required husbanding to-day more than ever before and the Trust intended, in co-operation with such bodies as the Agricultural Research Council, to do its share of this important work.

In a statement presented by the Duke of Beaufort, the Hon. Treasurer of the Trust, reference was made to the probability that the establishment of the new research centres would necessitate inroads into present capital, unless income could be enlarged. Dr. Wooldridge estimated that an annual income of £100,000 eventually would be required fully to enable the Trust to carry out its full programme, which also included the provision of research training scholarships and research fellowships, while it was proposed to discuss with the veterinary colleges ways in which the Trust could best assist these institutions: the main aim of the Trust was to help forward veterinary science in every way. No financial assistance was received from the Government: funds were raised from interested bodies and individuals, but other helpful sources were the auction of nominations for thoroughbred sires, while it was hoped to benefit from an additional charge on race-cards at some of the more important meetings.

The Duke of Norfolk at the end of the conference summed up the situation by saying that the Veterinary Educational Trust was now in a position, subject to the backing of everybody in the agricultural world, to branch out and to move forward towards the attainment of the aims which had been envisaged at its foundation.

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EVANS' STUDENTSHIP GRANTS

The Trust, one of whose objects is to increase the future personnel of the veterinary profession by aiding undergraduates, announces grants to five students for fees and books in respect of their final year at English, Irish and Scottish Veterinary Colleges. They are as follows:—

£37 10s., W. J. Prendergast, Clontarf, Dublin, final year at the Veterinary College of Ireland.

£41 6s., R. J. Holmes, Rose Bank, Little Eccleston, Preston, final year at Liverpool School of Veterinary Science.

£42 10s., David McCracken, Langside, Glasgow, final year at Glasgow Veterinary College.

£46, J. C. Wilson, Longmiddry, East Lothian, final year at Royal (Dick) Veterinary College.

£50, J. E. Gray, Fetcham, Leatherhead, final year at the Royal Veterinary College.

These grants were made under the terms of the Evans' Medical Supplies, Limited, Speke, Liverpool, final year studentship in connection with the Trust.

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In response to the appeal of the Earl of Sefton, the Council of the Royal Lancashire Agricultural Society has decided to contribute £250 in each of the next two years to the funds of the Veterinary Educational Trust for the advancement of research work and other activities in the interests of the livestock industry.

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The National Agricultural Advisory Service

In the Parliamentary and other columns of this and earlier issues of *The Veterinary Record* have appeared references to the setting up by the Ministry of Agriculture of the National Agricultural Advisory Service, this taking place formally on October 1st, 1946—the date chosen as the "appointed day" under Section I of the Agriculture (Miscellaneous Provisions) Act of 1944. The function of the Service is to provide technical advice and instruction free

of charge to those engaged in agriculture and horticulture in England and Wales. As from that date the new Service has taken over (*a*) responsibility for general advisory work from local education authorities, and (*b*) responsibility for specialist advisory work (except agricultural economics) from universities and agricultural colleges.

The main advantages that, it is claimed, should follow the welding of the separate advisory services into a single national Service under the direction of the Ministry are these:—

1. A national organization will be able completely to co-ordinate specialist and general advisory work and gradually level up the marked differences which have existed between one county and another.

2. It will be possible to provide more specialists than have been available in the past—in particular, to extend the specialist service into the fields of agricultural husbandry, *e.g.*, animal feeding and grassland management, and as qualified officers become available into new fields such as farm buildings.

3. Opportunity will be provided for advisory officers to experiment with and try out new methods by means of a chain of experimental husbandry farms and horticultural stations, representative of the several farming types and conditions obtaining in this country.

4. Improved salaries and wider prospects of promotion should induce first-class young men and women to make advisory work their career.

The N.A.A.S. county staffs will be integrated with the staffs of the C.W.A.E.C.'s, and the County Advisory Officer will normally be also the Executive Officer to the Committee and, as such, responsible under the Committee for co-ordinating and supervising the whole of the work of their staff, both advisory and non-advisory. Programmes of advisory work for each county will be prepared from time to time by the County Advisory Officer in association with the Committee and with the Provincial Director, and will be put before the Committee for their general approval.

About 1,750 officers are required to staff the N.A.A.S. during the next few years. As a result of interviews by Selection Boards appointed under the aegis of the Civil Service Commission some 1,500 candidates have been selected and have been offered posts. The difference is accounted for by the need to have vacancies available for those still serving in the Forces, and by the serious shortage in many fields of men with a sufficient measure of practical farming experience and academic training—these being the two essential qualifications for appointment to the N.A.A.S.

The Livestock Inspectorate of the Ministry is being merged with the N.A.A.S. and will form part of the Livestock Husbandry Section of the Service, which will consequently deal not only with technical advice on livestock matters but also with non-advisory subjects such as the licensing of bulls and boars and artificial insemination. Similarly, Horticultural Officers of the N.A.A.S. will carry out the functions hitherto undertaken by the Ministry's Educational Inspectorate, which is also being absorbed into the N.A.A.S.; while the Poultry Advisory Service is being brought within the N.A.A.S. as well.

The Structure of the Service

There will be a small headquarters staff, as already announced, consisting of: Professor J. A. Scott-Watson, C.B.E., M.C., M.A., Chief Education and Advisory Officer to the Ministry; Mr. W. K. Slater, D.SC., F.R.I.C., Mr. H. V. Taylor, O.B.E., D.SC., Mr. L. G. Troup, O.B.E., B.SC., Senior Advisory Officers. These senior officers will be in close touch with the Agricultural Improvement Council which is representative of scientists and of prominent farmers and growers, and will seek the advice of that body on important questions of policy relating to advisory work. The Agricultural Improvement Council is itself in close contact with the Agricultural Research Council and will draw its attention to any practical problems on which research seems to be needed. The Agricultural Improvement Council will also be the channel through which the results of research will be passed for practical application by the N.A.A.S. at experimental husbandry farms and horticultural stations so as to make them speedily available for translation into farming practice.

The N.A.A.S. is organized in eight Provinces. Specialist Advisory Officers will be appointed in each Province eventually in the following subjects:—

Science Specialists.—Entomology, Plant Diseases, Soil Chemistry, Animal Nutrition, Bacteriology.

Husbandry Specialists.—Farm Crops, Grassland, Livestock, Milk Production, Farm Machinery, Farm Buildings, Poultry.

Horticultural Specialists.—Glasshouse Crops, Fruit, Vegetables.

The Provincial Director will be responsible for co-ordinating and supervising the whole of the specialist and general advisory work in his province, and the specialist officers will keep in the closest touch with the progress of research work in their subjects and also with teaching centres, with a view to disseminating among the county advisory staffs the latest knowledge.

The county staffs of the Service will consist of general advisory officers and a certain number of officers well qualified in the subjects of leading importance within any county. They will be under the direction of a County Advisory Officer of the N.A.A.S. and will comprise District Advisory Officers and County Advisers in Milk Production, Livestock Husbandry, Horticulture, Poultry and Farm Machinery; and according to circumstances and needs, there will also be Crop Husbandry and Grassland Advisers.

One of the important functions of the N.A.A.S will be to test the findings of research workers under the wide variety of farming conditions that obtain, with the aim of assisting the speedy practical application of the results of research. For this purpose it is proposed to set up a series of experimental husbandry farms and horticultural stations throughout the country in accordance with a programme drawn up under the guidance of the Agricultural Improvement Council. Close co-operation between the N.A.A.S. and the staffs of local education authorities employed in agricultural education will be arranged. The N.A.A.S. will give staffs of farm institutes a share in advisory work according to their qualifications and experience, and will in turn be ready to assist local education authorities in the discharge of their duties so far as the resources of the N.A.A.S. permit. Local Education Authorities for their part are asked to assist the N.A.A.S., *e.g.*, by the loan of farm institutes or school premises for lectures and demonstrations, and by setting aside at need limited areas of institute farms for experimental husbandry work.

At a Press conference on Monday last Professor J. A. Scott-Watson, Chief Education and Advisory Officer, said that the aims of the new Service were to bring the latest scientific and research knowledge to the farmers in matters of horticulture, animal feeding, etc., and to give advice on crops, soil, climate and other features connected with good farming in this country.

Having explained the organization of the new Service, Professor Scott-Watson said that it must have a steady stream of new knowledge: the Loveday Committee on Education was co-operating on the side of technical training; the universities were training men to become technical and research advisers.

There had been and still were many difficulties in starting this Service and getting it under way. The main difficulty had been the housing of workers and their families near the different experimental farms. At present many of the headquarters were still in the universities, who had been very helpful in letting them remain until other accommodation could be found.

The expenditure of the scheme was expected eventually to be £1,000,000 per year, not including the money spent on the experimental farms before they were equipped.

Regarding livestock, Professor Scott-Watson, in answer to a question, said that the National Agricultural Advisory Service would be very glad to receive applications from men with veterinary qualifications on the livestock side, and there was a great deal of professional work for men with those qualifications which could not be done by anybody else. They did not specifically require a veterinary training for the livestock advisers, but should be very happy to receive men with these qualifications if they could be spared from the Animal Health Division. The Service would have the Veterinary Investigation Officers, but they would work under the Ministry of Agriculture and not under the new Service, and one veterinary investigation officer would be available at each provincial centre. In all there would be 80 livestock officers needed.

Referring to poultry, the report of the Poultry Research Group was not then available, but was practically ready.

Professor Scott-Watson said that it was hoped, fairly soon, to be in a position to produce a highly efficient scheme to bring better food to the people of this country.

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AGRICULTURAL RESEARCH COUNCIL

Post-Graduate Scholarships in Agricultural Science and in Animal Health

The Agricultural Research Council announce the following awards of Post-Graduate Scholarships in Agricultural Science and in Animal Health, to take effect from the beginning of the academic year 1946. Such scholarships were last awarded in 1941, after which, as a war-time measure, they were discontinued. On this occasion says the announcement, the potential needs for specialist Advisers in the National Agricultural Advisory Service were taken into account as well as those of the Research Service.

J. M. Barry, B.A. (HONS.), of Oxford University, a three-year

Research Scholarship in Animal Biochemistry; J. R. S. Fincham, B.A. (HONS.), of Cambridge University, a three-year Research Scholarship in Plant Genetics; A. Ibbotson, B.SC. (HONS.), of Birmingham University, a three-year Research Scholarship in Entomology; D. J. R. Laurence, B.A. (HONS.), of Cambridge University, a three-year Research Scholarship in Animal Genetics; B. C. Loughman, B.SC. (HONS.), of the University College of Wales, Aberystwyth, a three-year Research Scholarship in Biochemistry; Miss M. T. Morton, B.SC. (HONS.), of Edinburgh University, a one-year Research Scholarship in Plant Pathology; Miss U. Parsons, B.A. (HONS.), of Cambridge University, a three-year Research Scholarship in Animal Physiology; Miss J. N. Winfield, B.SC. (HONS.), of Leeds University, a one-year Research Scholarship in Plant Physiology.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

FOOT-AND-MOUTH DISEASE:

Dorset.—Ferncroft Farm, Carey, Wareham, Dorset (Oct. 19th).

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LEGAL NOTE

Attempt to Dope Greyhounds.—At the Central Criminal Court on Monday last, three kennel boys, Raymond Eric Coston, 22, Donald William Hoare, 17, and Claude Edward Parrish, 16, were brought up for judgment, having pleaded "Guilty" to attempted fraud. It was alleged that they conspired to dope greyhounds at Hackney Wick Stadium. Coston and Parrish were both bound over, and judgment on Hoare was postponed until the next session.

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UNIVERSITY COLLEGE FOR WEST INDIES

The Secretary of State for the Colonies has decided, after consideration of the Report of the West Indies Committee of the Commission on Higher Education in the Colonies, to adopt the Committee's recommendation that a West Indian University College should be established in Jamaica. In the first instance the college will be given the status of a university college and will prepare its students for the degrees of the University of London. It is hoped that this formative period will not be prolonged beyond the minimum time necessary to establish the reputation of the university college as a centre of teaching and research. He has further decided, in agreement with the University of London, which sent two delegations to the West Indies to investigate the problem on the spot, that the temporary medical school which the committee recommended in anticipation of a permanent medical faculty of the college should also be established in Jamaica as an integral part of the college. As a first step in giving effect to these decisions and on the recommendation of the Inter-University Council for Higher Education in the Colonies, the Secretary of State has appointed Thomas Weston Johns Taylor, C.B.E., M.A., D.SC., to be principal-designate of the college with effect from October 1st, 1946. Dr. Taylor, who is 50, is a scientist with a distinguished career in Oxford. The further measures required to establish the University College and temporary medical school are already under discussion between the Colonial Office and the academic bodies and Colonial Governments concerned.

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CARMARTHENSHIRE'S DRIVE FOR TUBERCULOSIS-FREE HERDS

Carmarthenshire has 3,535 attested cattle herds, the highest number in any county in England and Wales, and the *Western Mail* reports that the county agricultural committee is sparing no effort to make the area, which embraces part of Pembrokeshire and Cardiganshire, a "clean" one under the Tuberculosis (Attested Herds) Scheme. "To this end the committee has asked the Ministry of Agriculture to increase its staff of veterinary inspectors in order to concentrate on tuberculosis attestation." At the meeting at which this decision was taken Alderman David Davies, Uwchgwili, said that Carmarthenshire had won the shield given by Lord Bledisloe for the highest number of attested herds in the country, and the trophy would be presented shortly in London to a farmer from the county, representing those with attested herds.

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The Milk Marketing Board will operate a cattle breeding centre service (artificial insemination) as from December 1st of this year from temporary premises at Frant put at their disposal by the Wellcome Research Foundation. The Board will later erect a new centre at Whiligh on a site purchased from Lord Courthope. The centre is to be known as the Frant-Whiligh Cattle Breeders' Society.

DRYING THE CROPS

Commenting in a recent issue of *The Daily Telegraph* on an article on the above subject, published in an earlier number of that paper, by Mr. Percy Smith, Captain Oswald Dixon, M.R.C.V.S., of Blandford, describes it as coming at a timely moment and adds: "In 1936 I was a member of a postgraduate course at the Royal (Dick) College, Edinburgh, and when we were studying the subject of Animal Dietetics Professor Dr. Linton expounded the advantages of this method for treating grass and thereby producing a food equal in quality and nutrition to the natural grass grazed during the outdoor season. If this method were adopted artificials could largely be dispensed with.

"I have seen the whole process demonstrated. It was then a very easily handled outfit, apparently nothing more than a threshing machine in size, and with an apparatus for the driving of hot air into the drying box. The result was amazing."

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

Notice to Correspondents

The Editorial Committee regrets that, the paper supply situation having deteriorated, it has become necessary to ask correspondents again to accept a limitation on the length of letters submitted for publication. Accordingly, contributors to our Correspondence Columns are requested to note that, until further intimation is made, their communications must not exceed 350 words.

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INTERPRETATION OF TUBERCULIN REACTIONS: A CORRECTION

Sir,—The abridged report of the discussion on the paper "Studies in Tuberculin Sensitivity in the Bovine," read by W. R. Kerr, H. G. Lamont and J. L. McGirr before the Northern Ireland Division, attributes to me the following statement: "That the character of the swelling was of no significance. The terms diffuse, circumscribed, etc., were out of date." This observation should be qualified by the words "*in the Stormont Test.*"

In contradistinction, the character of the swelling or reaction, in the double intradermal comparative test applied in this country, is undoubtedly of very considerable significance and is one of a number of factors which include health and past history of the herd, clinical examination, tuberculin used and the dose injected, the depth and siting of the injections and finally reasonably accurate measurement of reactions induced which contribute to the ultimate interpretation and diagnosis which in my view should be vested in the veterinary surgeon responsible for the technical application of the test. Experience of initial tests of herds over many years emphasizes the need for curbing the undue optimism of owners following "vardstick" interpretation of such tests particularly where the health history and recruitment to the herd is not well known to the veterinary surgeon.

Yours faithfully,

"Rockholme," GEO. N. GOULD.
12, Landguard Road,
Southampton.
October 19th, 1946.

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A "POLITICAL" ADVERTISEMENT

Sir,—Many of us, like Captain Abbott, must regret the constant intrusion of politics into our daily lives. We long to be allowed to expend all our energies in our calling, without hindrance or diversion.

However, it is quite obvious, even from reading the *Record*, that political questions—how we are governed and by whom, and with what political philosophy—deeply affect us all, and this influence shows signs of increasing.

The profession did not ignore the war, neither can we ignore politics, even party politics, and the changes in our work that political events may thrust upon us. To try and insulate ourselves from the outside world by refusing to have such matters brought to our notice might cause us to be taken by surprise in any new situation, thus playing into the hands of would-be political dictators.

I therefore hope that the N.V.M.A. will never adopt Captain Abbott's suggestion, and refuse advertisements on political grounds. It can surely be left to our own judgment to ignore those appeals of which we disapprove.

Yours faithfully,

495, Footscray Road, CONNIE M. FORD.
New Eltham, London, S.E.9.
October 14th, 1946.